

signals by satellite carriers.¹¹³ NAB is not aware of any reason that the Commission's existing rules applying these principles to satellite carriers cannot be applied directly to carriage of digital television signals. Should satellite carriers claim (implausibly) that they are less able to comply with program exclusivity rules in retransmitting digital as opposed to analog signals, NAB will address those contentions in reply comments.

Conclusion

The FCC began the digital transition in 1996 when it adopted a technical standard for DTV. Local stations have been on the air in digital since 1998. Yet, five years after broadcasters began their part in the Nation's conversion to digital television, cable and satellite operators continue to sit on the sidelines. No one has suggested a scenario which leads to a rapid end of analog television service that does not include carriage by cable and satellite of local DTV signals during the transition.

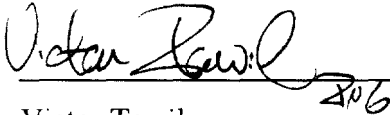
Requiring cable and satellite operators to carry DTV signals advances all of the interests Congress identified as supporting must carry in the Cable Act, and there are additional compelling interests supporting a rapid transition to digital television. An overwhelming amount of evidence demonstrates that DTV carriage during the transition will not burden cable or raise any First Amendment issues not already disposed of by the Supreme Court in *Turner*.

¹¹³ *Further Notice* at ¶ 137.

For the foregoing reasons, the Commission should promptly adopt a rule requiring cable and satellite operators to carry the digital signals of local commercial television stations.

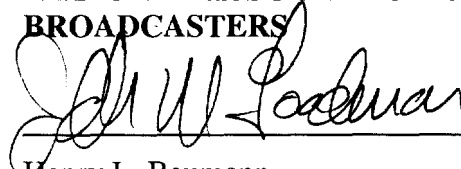
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June 11, 2001

APPENDIX A

IMPLICATIONS OF THE ADOPTION OF DIGITAL MUST-CARRY ON THE SPEED OF THE BROADCAST DTV TRANSITION: A SCENARIO ANALYSIS

Prepared By

Dr. Joseph S. Kraemer

&

Richard O. Levine

**ON BEHALF OF THE NATIONAL ASSOCIATION
OF BROADCASTERS**

June 11, 2001



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I. EXECUTIVE SUMMARY

- 1. If the transition from analog to digital is allowed to follow a typical market adoption scenario, then the transition can be reasonably expected to take more than 20 years. This is the baseline scenario.**
- 2. There are valid business and public policy reasons to accelerate the transition. Such reasons include:**
 - a. The preservation of free-to-air television in the United States;**
 - b. The need to reclaim spectrum to facilitate the build out of next generation wireless systems;**
 - c. The increase and/or acceleration of spectrum auction revenues for the federal government; and**
 - d. The avoidance of a prolonged period of duplicative, expensive, parallel analog and digital system operation.**
- 3. Digital must-carry would enable the more rapid transition of broadcast television from analog to digital. Under a digital must-carry scenario, analog turn off could occur in the 2010-2012 period. This is the accelerated scenario.**
- 4. Digital must-carry is required.**
 - a. The situation has not changed since *Turner II*.**
 - Cable operators have an economic incentive not to carry free-to-air broadcast digital channels;**
 - The existence of only a limited number of voluntary digital carriage agreements supports must-carry; and**
 - Mass market consumers will not purchase and install antennas for over-the-air reception.**
 - b. Digital must-carry will trigger mutually beneficial actions (“virtuous circles”) in both receiver manufacturing and programming.**
- 5. The core issue remains not if the transition will occur but when. If a 2020 and beyond transition is not acceptable, then digital must-carry is mandatory.**

II. INTRODUCTION

A. Purpose

This report was prepared at the request of the National Association of Broadcasters (NAB). It addresses two questions:

1. In the absence of further government intervention, what is a reasonable scenario for the transition of broadcast television from analog to digital?
2. What effect would digital must-carry have on the nature and rate of the transition?

The results of the analysis are described in detail in subsequent sections of this report. However, the dominant conclusion is that, if there are business and public policy reasons to accelerate what-would-otherwise-be more than a 20-year process, then digital must-carry is mandatory.

B. Background

On March 26, 2001, the FCC published in the *Federal Register* a *Further Notice of Proposed Rulemaking*, regarding cable system carriage of digital television broadcast signal. In the *Notice*, the Commission requested that the parties develop a more detailed factual record regarding the benefits and burdens of a dual analog/digital must-carry requirement.¹ The Commission stated that development of an expanded record was of importance.

In the Telecommunications Act of 1996 (1996 Act), Congress authorized the FCC to “issue additional licenses for advanced television services” and the Commission has done so. More specifically, the FCC established a construction period, ending on May 1, 2003, by which time all commercial and non-commercial broadcast stations must be broadcasting digital transmitted programming.² **Congress, the FCC, and both the Bush and Clinton Administrations have all articulated the public’s interest in a rapid and predictable transition of broadcast television from analog-to-digital transmission.**

¹ The FCC viewed the establishment of such a requirement as raising significant First Amendment questions that need to be addressed under the tests established in *United States v. O’Brien*, 391 U.S. 367 (1968) and *Turner Broadcasting System v. FCC (Turner II)*, 520 U.S. 180 (1997). In *Turner II*, the Supreme Court upheld Congressional adoption of cable must-carry requirements for local broadcast stations as enacted in the Cable Television Consumer Protection and Competition Act of 1992 (1992 Cable Act).

² *Fifth DTV Report and Order*, 12 FCC Rcd. 12809, 12840-41 (1997); all commercial stations must be broadcasting digitally by May 1, 2002.

The Balanced Budget Act of 1997 amended the 1934 Act to establish a statutory timetable for the transition, requiring the termination of analog broadcasting by December 31, 2006. In turn, spectrum associated with channels 60-69 and 52-59 was to be reallocated to other services, with most being subject to auction. However, a station may request an extension of the December 31, 2006 deadline if more than 15 percent or more of the television households (a) do not subscribe to multichannel video program distributor that carries the digital channel of each local broadcaster; and (b) do not have either at least one television set capable of receiving the local digital television channels, or at least one converter box that will display local digital channels on an analog set.³

The Administration's Fiscal 2002 Budget, released in April 2001, addresses the auction timing issue:

The Administration is proposing authorization language that provides a legislative framework for FCC to develop regulations that promote clearing the spectrum in channels 60-69 ... for new wireless services.... The legislative language would also shift the statutory deadline for the 60-69 auction from 2000 to 2004 and shift the statutory deadline for auction of channels 52-59 ... from 2002 to 2006. As a result of the increased certainty about how and when the spectrum in channels 60-69 will become available for new entrants and shifting the deadlines for both auctions closer to when the spectrum is expected to become available, revenues for these auctions are expected to increase by \$7.5 billion.⁴

The FCC is required to modify its must-carry rules to ensure "cable carriage of such broadcast signals of local commercial television stations which have been changed to conform to" the FCC's standards for advanced television standards.⁵ The FCC has concluded that the existing must-carry statutory framework neither mandates nor prohibits a dual analog/digital must-carry requirement during the digital transition.⁶ Hence, the Commission established this *Further Notice of Proposed Rulemaking* to gather additional information on the appropriateness of a dual carriage requirement.

Dual carriage is relevant and significant to the analog-to-digital transition because of its potential impact on the speed of that transition. For example, the Congressional Budget Office (CBO) concluded that cable carriage of over-the-air digital broadcasts "is perhaps the most important factor affecting how quickly DTV reaches the largest number of households."⁷

³ 1934 Act as amended, section 309(j)(14).

⁴ *The Budget for Fiscal Year 2002*, p.150. For a summary of results from the most recent spectrum auction for wireless services, see "FCC Auction of Wireless Licenses Raises a Record \$17 Billion So Far," *Wall Street Journal Interactive Edition* (January 25, 2001).

⁵ Section 614(b)(4)(B) of the 1934 Communications Act (1934 Act), as amended by the 1996 Act.

⁶ FCC 01-22, paragraph 14. *Joint Petition for Reconsideration*, filed by NAB, MSTV, and ALTV (April 25, 2001).

⁷ CBO, *Completing the Transition to Digital Television* (September 1999), p.x.

This report addresses the probable speed of the transition with and without dual carriage. For purposes of this report, the term, 'dual carriage' refers to the simultaneous transmission of a broadcast station's analog and digital signals over cable networks during the period of transition from analog-to-digital.

III. BASELINE SCENARIO: IN THE ABSENCE OF GOVERNMENT INTERVENTION, THE TRANSITION WILL EXCEED 20 YEARS⁸

A. The Fragmented Broadcast Television Industry Supply Chain Complicates the Digital Transition

Unlike some countries, the broadcasting industry in the United States is privately owned and operated.⁹ As such, the conversion to digital television must make good business sense (i.e., be a profitable undertaking at a return on investment at least equal to alternative uses of capital available to the owners). At this point in time (June 2001), the business cases for DTV are in the preliminary stages for many firms. While there is a consensus that DTV will be eventually profitable, the exact timing of capital investments, the magnitude of the associated revenues, and the precise level of recurring and non-recurring costs remain uncertain for many of the firms affected. **Uncertainty means delay, particularly of capital investments; delay then breeds more uncertainty in an endless and pernicious cycle.**

The term supply chain refers to the series of supplier-to-buyer transactions that must occur in order for a product or service to be delivered to the ultimate end user. In the case of DTV, the end users are approximately 102 million television households scattered across 50 states and a few territories. These households tend to be concentrated in urban markets, each of which had by 1998, on average, 13 full power over-the-air channels.¹⁰ Furthermore, the viewing public buys their TV sets from retail stores (e.g., Circuit City or Best Buy), all of which carry multiple TV brands, each of which has its own supply chain starting with microprocessors and integrated circuits manufactured in places like Malaysia and Taiwan.

There are supporting chains that feed the major supply chains that will provide DTV products or services to consumers. Examples of these enabling supply chains include: (1) production equipment to produce the digital programs; (2) control room and transmission equipment to broadcast/distribute programming; and (3) measurement systems to enable advertisers to calculate a approximate return on marketing investment. In addition, there is a financial supply chain to provide the capital necessary to make it all happen. In effect, the DTV supply chain is itself a linked series of specialized supply chains.

Figure 1 illustrates — albeit in a simplified form — the basic DTV supply chain. Keep in mind that every corporate participant in this supply chain will require a business plan to

⁸ Adapted from testimony of Joseph S. Kraemer, before the Senate Commerce, Science, and Transportation Committee (March 1, 2001).

⁹ This includes PBS which is organized as a non-profit private corporation.

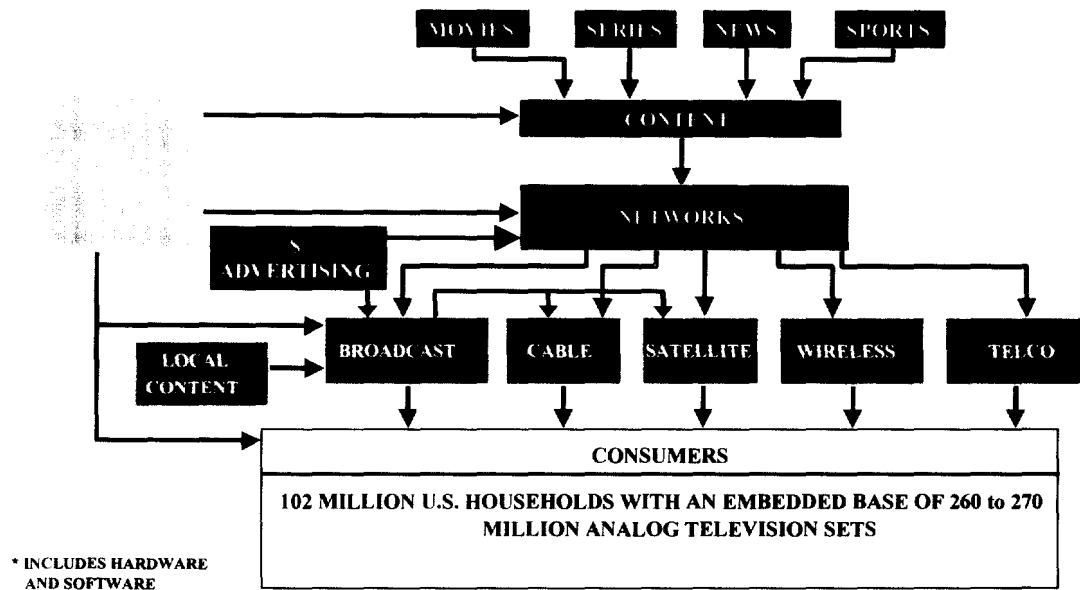
¹⁰ CBO, *Completing the Transition*, pp.3-4. The 13 available in 1998 constituted an increase of 45% over what was available in 1981.

justify the time, effort, and cost of the DTV transition and to structure the appropriate scheduling milestones.

Figure 1

The DTV Supply Chain:

The Supply Chain for Video to the Home is Very Complex



The key conclusion is that *no dominant player exists*. The television supply chain is fragmented at each level from manufacturing of equipment through production and distribution of content. Thus, every company in every category - - broadcasters, advertisers, networks, consumer electronics - - must formulate their own unique business strategy. This formulation, meshing, and revision of literally thousands of independent business strategies takes time measured in years. Then, given the typical consumer adoption cycle, it becomes clear why the DTV transition could take decades.

B. The Critical Issue is Sustainable Mass Market Demand for DTV - - When and How?

Television is a consumer market business. There are 102.2 million TV households in the United States. This is out of a total of 104 million households which is equivalent to 98.3% penetration.¹¹

The average TV household owns 2.6 sets which leads to the conclusion that there are between 260 and 270 million sets operating in the U.S.¹² The proportion of these sets that are capable of receiving digital broadcasts is so miniscule as to be immaterial. For purposes of analysis, as of May 2001, the entire embedded base of sets in the U.S. should be considered analog.

The American consumer buys over 30 million TV sets annually, so on average almost one in three TV households buy a set each year.¹³ Almost all the sets purchased currently are analog, thereby replenishing the analog base even while the digital transition is getting underway.

The mass market of over 100 million TV households attracts advertisers that want to expose their products/services to a mass audience. Because broadcast television has access to this mass audience, advertisers pay the networks and the local broadcasters to develop, package, and distribute programming that reaches consumers as “free-to-air” television. Consumers select programs based on their personal preferences which provides the audience that justifies advertisers paying to create and distribute the programs. **If consumers cannot view the programs, then the entire free-to-air system collapses.**

For broadcast DTV, there must be a mass audience of viewers available, or there will be no incentive to produce and distribute digital programming. That in turn will have a negative impact on the production of DTV sets since the mass market for sets will only occur in an environment when consumers conclude that the viewing experience justifies buying a DTV set. Hence, the critical factor for both programming and sets is audience access.

The DTV set market will begin with purchases by two market segments. One is the very small “technophiles” segment. They will respond to marketing themes that emphasize digital technology. If DTV sets could be sold as build it yourself kits, this group would buy the kits. This segment combines the passion for technology with the discretionary income necessary to buy the earliest model digital sets. If this segment remains

¹¹ Nielsen Media Research as shown on the web site of the Television Bureau of Advertising, (www.tvb.org).

¹² Calculated as 2.6 sets times 102.2 million TV households.

¹³ Includes “analog direct view, analog TV/VCR combinations, and analog projection televisions.” Source: Consumer Electronics Association (CEA).

enthusiastic after purchase, then by word of mouth and in leading-edge technology magazines the momentum will build to buy DTV sets.

The “videophiles” will initiate purchases concurrently with the technophiles. The difference between the two will be less one of timing than on emphasis. The technophiles will stress the technology and the potential “convergence” of TV and PC. Given the availability of programming, then the videophiles will emphasize the improved picture, better audio, and potential for enhanced program features. Videophiles are the classic “early adopters” who will be somewhat price insensitive and buy the early DTV sets for premiums of 50% or more over analog counterparts.

The combination of technophiles and videophiles constitute the “early market” for DTV. **The total number of videophile and technophile households combined probably does not exceed ten to fifteen percent of TV households**, not nearly enough to qualify as a mass market.

The mass market for DTV will follow the early market. **An absolutely critical challenge for set manufacturers will be moving from the early market to the mass market without delay.¹⁴ At that point in time, the market “tips” from a supply-driven early market to a self-sustaining mass market as shown in Figure 2.**

Keep in mind that there exists currently a \$10 billion annual market for analog sets. A worst case scenario for set manufacturers would be that the market for analog sets sold in the U.S. slows down in anticipation of digital sets. This could create a multi-year problem for set manufacturers who would be forced to lower prices on analog sets and accept lower profit margins while financing the development and rollout of DTV. Therefore, delay between the early market and the mass market could have material adverse financial consequences for the set manufacturers and their suppliers, financing sources, employees, and shareholders. This would also adversely affect the other stakeholders in the television supply chain such as programmers, the networks, broadcasters, and consumers.

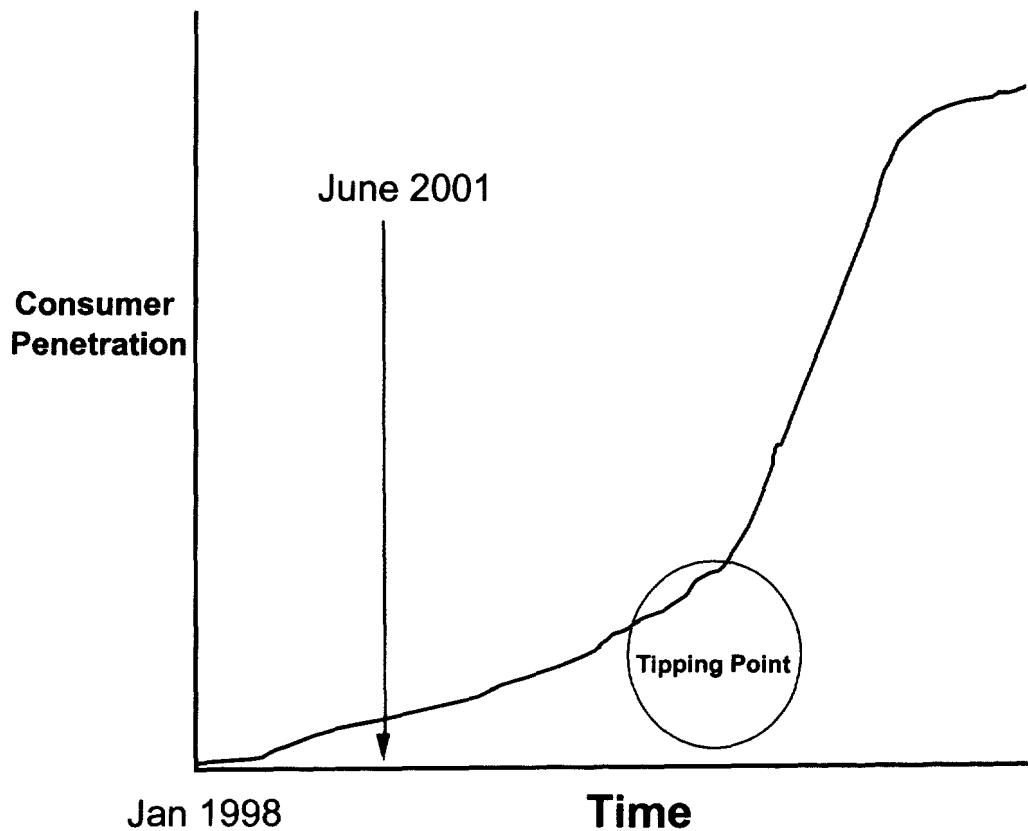
The test for digital set manufacturers then will be rolling from the early market to the mass market with increasing momentum and no marketing stall. To achieve this will require access to the mass market, particularly its leading edge.

Two factors will affect ease of entry into the mass market. They are: (1) **buyer perception of value**; and (2) **buyer perception of risk**. From the consumer’s perspective, the critical factor in determining value is content (i.e., programming).

¹⁴ Moving from an early to a mass market for high technology constitutes a marketing challenge of major significance. For more information, read Geoffrey Moore’s *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers* (1991); see also Moore’s *Inside the Tornado* (1995), especially Part One, “The Development of Hypergrowth Markets.”

Figure 2

**The Critical Issue is the Point When the DTV Market
“Tips” and Becomes Self-Sustaining¹⁵**



Afterall, the advantage of digital over analog consists of high definition television (HDTV), multichannel standard definition television (SDTV), interactive program-related information, and CD-like quality sound.

Unlike early adopters of high technology, the mass market has a zero tolerance for risk. They want to buy a digital set that meets or exceeds performance expectations, is very easy to set up and use, and has no maintenance cost at least for five years. Furthermore, the price must be “reasonable” relative to analog alternatives.

Mass market buyers are not pioneers. They perceive themselves to be buying TV sets that meet certain requirements (in terms of reliability, quality, functionality, and price-to-value ratio) rather than buying digital technology for its own sake.¹⁶

¹⁵ Adapted from testimony of Joseph S. Kraemer, before the Senate Commerce, Science, and Transportation Committee (March 1, 2001), p.4.

¹⁶ The early market (technophiles and videophiles) will buy technology because it is new; mass market buyers want predictability and ease of use.

Which comes first, the programming or the set upon which to watch the programming constitutes the proverbial chicken versus the egg problem. The critical point is that the market-driven programming-set interaction will take years... probably decades... to resolve to the point where DTV constitutes a mass consumer market.

C. Mass Market Audience Access is the Prerequisite for Advertisers to Pay for Digital Programming

The economics of television are simply that “broadcasters are in the business of producing *audiences*. These audiences, or means of access to them, are sold to advertisers.”¹⁷

Without a potential mass-market audience for free-to-air digital television, programmers will have a reduced incentive to develop, and the networks to invest in, the advanced digital programming that will attract DTV set purchasers.¹⁸ This outcome is in contrast to other transitions in which vertical integration has “internalized” the benefits of a transition permitting the rollout of receivers and video content in a relatively parallel timeframe.¹⁹

There appears to be a general consensus among industry participants that the key near-term driver of purchases of digital sets capable of receiving broadcast digital programming is the availability of programming that takes advantage of digital television’s capabilities.²⁰ Development of such programming, however, requires financial resources, which, in turn, require the generation of revenue based on the required investment.

Broadcast television is based on an advertiser-supported business model of bringing a mass-market audience to local and national advertisers. Advertisers, in turn, compensate broadcasters or other industry participants based on the number of people watching the program and the demographics of that audience. Advertising revenues are generally categorized as network (paid to a network for insertion in network programming), national spot (paid to a station by national advertisers for insertion in other available time controlled by the station), syndication (paid to syndicators for insertion in syndicated programming), and local spot (paid by local advertisers stations to insertion in time that

¹⁷ S. Wildman & B. Owens, *Video Economics* (1992), p.3; see also Chapter 5, “Network Economics.”

¹⁸ For insight into what drives programming decisions and the interaction of audience size and program investments, see “Media World Cites Networks, Networks Cite Lack of Media, *Wall Street Journal Interactive Edition* (April 2, 2001). See especially the quote by the GE executive that “if you talk about investment, return and value, you’ve got to have a significant enough audience.”

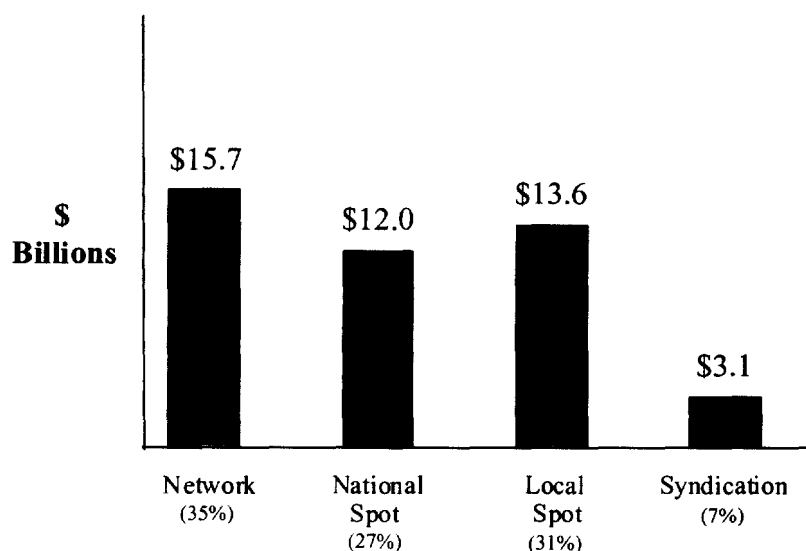
¹⁹ For example, during the transition to color, RCA both built TV sets and controlled NBC.

²⁰ See *comments* of the Consumer Electronics Association, MM Docket 00-14, p.14, April 6, 2001.

the station controls). Advertising revenues are allocated between networks, syndicators, and local broadcasters pursuant to contractual arrangements, such as affiliation agreements. Figure 3 shows the estimated distribution of advertising expenditures by category for the year 2000.

Figure 3

Advertising Distribution (2000)



Source: Universal McCann

Except for news, local sports, and public affairs programming, local broadcasters generally obtain their programming from other providers, such as networks and national program syndicators. These sources are dependent on advertising revenues, which, depending on the type of programming, may be both current advertising revenues (such as from sporting events) or from anticipated future advertising revenues (from the sale of popular programs into rerun syndication).

D. Color Television is an Example of a Prolonged Transition

While the transition to digital television is more complex than the transition to color (e.g., the lack of backwards compatibility for digital signals), it provides a precedent regarding the “virtuous circle” of content creation and mass market receiver penetration. During the 1950’s, RCA was the dominant provider of color televisions, and RCA’s NBC network was the dominant provider of color programming, with CBS having only

occasional color programming, and ABC, none.²¹ Average set prices fell from \$800 in the mid-'50s to about \$400 in 1960.²²

"From 1958 to 1964, only NBC telecast an extensive regular schedule of color programs. CBS did one or two 'Bow! parades. ABC did no color telecasting until 1964, when they began two weekly cartoons...."²³ However, with dropping set prices and improving quality, along with NBC's color schedule, by 1965, 5.3 percent of television homes had color sets.²⁴ Then almost a decade after color television sets were introduced, the tipping point occurred:

But by 1965, the penetration of color sets in the U.S. *was sufficient to be a significant factor in program ratings*, and in the spring of that year CBS made a sudden announcement that it would present virtually all its fall schedule in color. ... Not to be left behind, ABC immediately tooled up and became a full color network the following year.²⁵

The 1966-67 season brought total color from all three networks to prime time viewing. The total network color programming brought about a boom in color receiver sales. Lower prices and more reliable sets had started color receiver set sales rising in 1964, but the full network color provided the boost.²⁶ Locally organized color programming then followed.

The color television household penetration for the 1960-1980 period is shown in Figure 4. Note that from introduction to 85% penetration took 27 years. The first half of which saw color penetration go from zero to ten percent. It then took another 13 years to go from ten percent to 85%. If this same pattern prevailed for DTV, 85% penetration would be achieved about 2025.

E. Under Typical Baseline Assumptions, the Transition from Analog to Digital will Take Over 20 Years

DTV requires a very long-term perspective. The transition to digital *could* take all of the next two decades and some years beyond and will affect literally all 102 million U.S. TV households.

²¹ L. Lichty and M. Topping, *American Broadcasting*, pages 78-79 (1975); C. Sterling and J. Kittross, *Stay Tuned (2d Edition)*, pp.353-54, 398 (1990).

²² *Stay Tuned*, p.658.

²³ *American Broadcasting*, p.79.

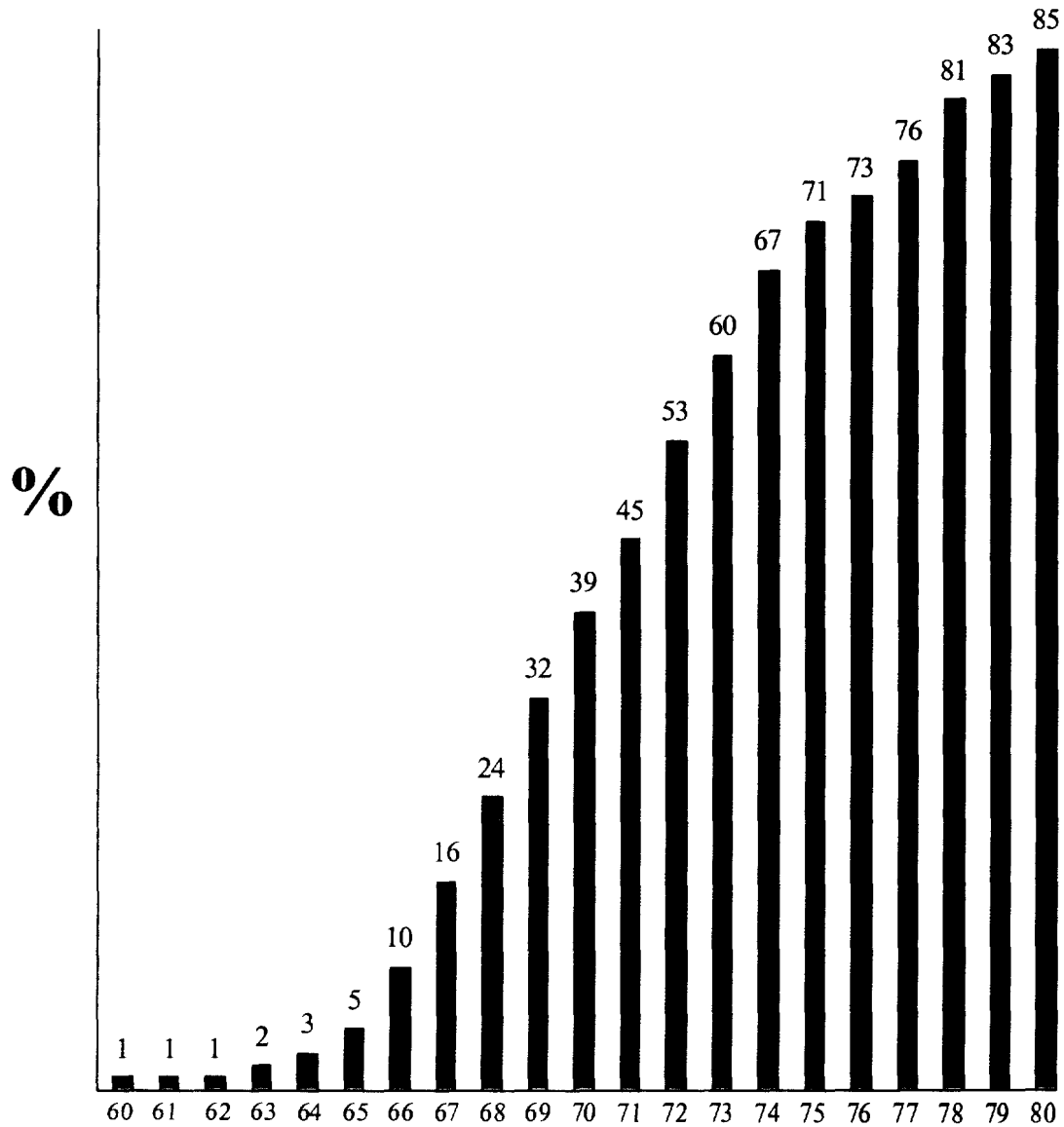
²⁴ *Stay Tuned*, p.658

²⁵ *Les Brown's Encyclopedia of Television, 3d Edition*, pp.122-123, 1992 (emphasis added).

²⁶ L. Lichty and M. Topping, *American Broadcasting*, (1975), p.79.

Figure 4

**Color TV Set Penetration
Expressed as a Percentage of TV Households**



Source: C. Sterling and J. Kittross, *Stay Tuned: A Concise History of American Broadcasting*, Second Edition, Appendix C.

Note: Color television was introduced into the consumer market in 1954 but was present in only one percent of TV households in 1960. The 85% penetration achieved in 1980 took 27 years (1954-1980).

With respect to DTV, the decisions made in the 2001-02 timeframe have a “long fuse,” and a “big bang,” with implications not known for three to five or even ten years, with a material impact on shareholders, employees, partners, suppliers, customers, and management- Many participants in the DTV transition are playing a game of “bet the company.”

Scenarios assist decisionmaking under conditions of uncertainty. Scenarios are not intended to predict the future. Rather, they can be used to facilitate an understanding of a reasonable range of options and the consequences of those options. The development of the scenarios used in this report are based on the results of interviews conducted in late 2000, as well as a general understanding of industry developments.

In order to be successful, scenarios must be reality based, taking into account external conditions that are “givens” and cannot be changed in the short or intermediate future. For DTV scenarios, it is important to remember that:

1. No dominant player exists.

The television supply chain is fragmented at each level from manufacturing of equipment through production and distribution of content. No equivalent of Microsoft in the PC operating systems business or Intel in the chip business – or even a duopoly like Coke and Pepsi – exists. Therefore, no single company by itself – not Sony, not General Electric, not Disney/ABC – can determine the outcome. Thus, each stakeholder must formulate their own unique strategies because there is no leader to fall in line behind.

2. Government is relevant and can affect the speed and course of DTV rollout.

DTV has a political dimension. The FCC, Congress, the courts, and one or more presidents yet-to-be-elected will influence the pace of DTV rollout.

It must be remembered that achievement of the legislated objective of 85% of households with digital capability (defined as the primary viewing set) could be attained by some mix of: (1) digital-to-analog cable set top boxes for analog sets in combination with digital set tops for digital sets; (2) satellite digital-to-analog conversion or distribution to digital sets; and (3) free-to-air digital broadcasts to digital sets or to analog sets with digital-to-analog converters. Also, the 85% is of primary sets only; it does not address the embedded base of 150+ million secondary sets (that are in addition to the 102 million primary sets in the U.S.).

For DTV the baseline scenario is summarized in Figure 5. As shown, this scenario would achieve 85% in the first markets with analog turn off in the U.S. after 2020. Critical characteristics include:

1. Government takes no action; FCC adopts “let the market decide” attitude.

2. **Advertisers lack assured access to the mass market of viewers for free-to-air programming.**
3. **Free-to-air broadcast TV becomes increasingly less relevant.**

DTV scenarios do not predict the future. However, they serve to: (1) sensitize stakeholders (including Government officials) to the implications of actions taken or not taken; and (2) emphasize the extent to which stakeholders must cooperate because no single company can control the outcome.

F. Under the Baseline Scenario, the Year 2020 is Probably the *Earliest* Reasonable Date for the Analog Turn Off Process to Begin

The major factors supporting this conclusion include:

1. **The fragmented nature of the television industry means there is no dominant player that can force change upon the industry.**
2. **The process of harmonizing the thousands of individual business plans of the relevant companies can take years.**
3. **A relevant example, the color television transition, took over 20 years.**
4. **Sustainable mass market demand is critical (i.e., when and how the transition occurs from the early market to the mass market).**
5. **Digital programming can trigger *mutually reinforcing consumer demand for both digital receivers and more programming* (i.e., dual ‘virtuous circles’). Mass market audience access is the prerequisite for advertisers to pay for digital programming.**
6. **However, without government intervention, there will not be assured mass market audience access which means delays in the development of programming and in the demand for sets. Therefore, consistent with the baseline scenario, the transition will be prolonged.**

Figure 5

Baseline Broadcast DTV Rollout Scenario

Legislation & Regulation	Consumer Electronics & Set-Top Technology	Programming/Content
<ol style="list-style-type: none"> 1. DTV not adopted as a priority issue by any administration or the FCC. 2. FCC adopts "let the market decide" approach on all key issues; FCC remains reactive not proactive. 3. No mandated free-to-air DTV carriage until analog shut off; broadcast DTV carriage prior to analog shut off only pursuant to voluntary agreements. 4. Government suspends spectrum auctions because bidders doubt spectrum will be vacated within business relevant timeframe; next generation wireless networks delayed in the U.S. 	<ol style="list-style-type: none"> 1. CE industry assigns low priority to free-to-air DTV; focuses on cable, satellite, and pre-recorded markets; R&D funds diverted away from free-to-air improvements. 2. Because of low volume sales, prices decline slowly as sales of free-to-air receivers are minor compared to cable and satellite digital receivers and monitors. 3. CE industry gradually and voluntarily installs all channel receivers so that analog-only new sales no longer occur after 2010. 4. Cable operators never make available converter boxes for DTV pass through until analog turn off. 5. Limited retail availability of affordable digital-to-analog converters until 2010-2012. 	<ol style="list-style-type: none"> 1. Networks hold production costs down; limited availability of HDTV and enhanced programming until after 2005-06 season. 2. Broadcasters make limited use of multiplex capabilities (e.g., due to lack of cable carriage and/or production costs). 3. Consumers indifferent to free-to-air DTV for most of first decade of 21st century. 4. Lack of consumer interest dooms advertiser interest.

IV. BUSINESS AND PUBLIC POLICY REASONS EXIST TO ACCELERATE THE TRANSITION

A. Public Policy is Very Relevant to the DTV Transition

The prior chapter established that a market-driven transition can be expected reasonably to take more than 20 years. **However, Congress, the FCC, and the Administration have all articulated the public's interest in a rapid and predictable transition of broadcast television from analog to digital.** The reasons for intervention fall into the following distinct, but overlapping, categories:

1. **The preservation of free-to-air television in the United States;**
2. **The need to reclaim spectrum to facilitate the build out of next generation wireless systems;**
3. **The increase and/or acceleration of spectrum auction revenues for the federal government; and**
4. **The avoidance of a prolonged period of duplicative, expensive, parallel analog and digital system operation.**

B. A Slow Transition Places the Preservation of Free-to-Air Television at Risk

The Supreme Court in *Turner II* reaffirmed that public policy supports the preservation of free-to-air television:

In short, Congress enacted must-carry to “preserve the existing structure of the Nation’s broadcast television medium while permitting the concomitant expansion and development of cable television.” ... *To the extent the appellants question the substantiality of the Government’s interest in preserving more than a minimum number of stations in each community, their position is meritless.*²⁷

Broadcast television is an important source of information to many Americans. Though it is but one of many means for communication, by tradition and use for decades now it has been an essential part the national discourse on subjects across the whole broad spectrum of speech, thought, and expression. ... *Congress has an independent interest in preserving a multiplicity of broadcasters to ensure that all households have access to information and entertainment on an equal footing with those who subscribe to cable.*²⁸

²⁷ *Turner Broadcasting System v. FCC*, 520 U. S. 180, 193 (1997) (emphasis added).

²⁸ 520 U. S. at 194 (emphasis added).

Congress reaffirmed the value of free-to-air broadcasting in late 1999 when satellite local-into-local became public policy.

The proposed provisions are intended to preserve free television for those not served by satellite or cable systems and to promote widespread dissemination of information from a *multiplicity of sources*. The Supreme Court has found both to be substantial interests, unrelated to the suppression of free expression. Providing the proposed license on a market-by-market basis furthers both goals by preventing satellite carriers from choosing to carry only certain stations and effectively preventing many other *local* broadcasters from reaching potential viewers in their service areas. The Conference Committee is concerned that, absent must-carry obligations, satellite carriers would carry the major network affiliates and few other signals. Non-carried stations would face the same loss of viewership Congress previously found with respect to cable noncarriage.

The proposed licenses place satellite carriers in a comparable position to cable systems, competing for the same customers. Applying a must-carry rule in markets which satellite carriers choose to serve benefits consumers and enhances competition with cable by allowing consumers the same range of choice in local programming they receive through cable service. The conferees expect that by January 1, 2002, satellite carriers' market share will have increased and that the Congress' interest in maintaining free over-the-air television will be undermined if local broadcasters are prevented from reaching viewers by either cable or satellite distribution systems. The Congress' preference for must-carry obligations has already been proven effective, as attested by the appearance of several emerging networks, which often serve underserved market segments. There are no narrower alternatives that would achieve the Congress' goals... In sum, the Conference Committee finds that trading the benefits of the copyright license for the must-carry requirement is a fair and reasonable way of helping viewers have access to *all local programming* while benefiting satellite carriers and their customers.²⁹

Contrary to existing public policy and law, the cable industry argues that "the public service rationale for special treatment of broadcasting is all but gone."³⁰ However, this argument ignores the reality of the millions of households and even more millions of sets that rely exclusively on free-to-air broadcasts, as well as the competition broadcasting provides for the cable TV industry.

It is very important to distinguish between "total sets," "primary sets," and "wired sets" (i.e., sets subscribed to a multi-channel video program distributor (MVPD), such as cable or satellite):

²⁹ Conference Report, Intellectual Property and Communications Omnibus Reform Act of 1999, Report 106-464 (November 9, 1999), pp.101-102. (Footnotes omitted.)

³⁰ Speech of Robert Sachs, President and CEO of NCTA, to The Media Institute (April 18, 2001), p.16.

1. There are 102 million television households with an average of 2.6 sets pre household (i.e., “total sets” equal 260 to 270 million).³¹
2. The “primary set” is the principal, most-watched set in the household (i.e., one per TV household means there are approximately 102 million primary sets).
3. The FCC has estimated that approximately 84 million TV households subscribe to an MVPD service.³² Therefore, approximately 18 million TV households rely on free-to-air broadcast signals for their video signal (i.e., rely on broadcast signals for their primary source of video-based information and entertainment).³³
4. Market research shows that TV households subscribing to MVPD services have approximately two sets ‘wired’ to that service. This means that 165 to 170 million sets receive their signal from a non-broadcast source.³⁴
5. Furthermore, the primary set in MVPD household is twice as likely to be a large screen set as the primary set in a free-to-air household.³⁵ Furthermore, the advantages of digital images are best demonstrated on a large screen set.
6. Approximately 100 million sets receive only broadcast free-to-air signals. Of these, an estimated 40 million are in the 18 million broadcast-only TV households and the remaining 60 million are in MVPD households.³⁶
7. Essentially, all of the sets in every category described above are analog. Any digital sets disappear in the rounding.

The 100 million ‘unwired’ sets and the 18 million ‘unwired’ households complicate greatly the transition to digital. The law says that 85% penetration of digital signal availability of *households* (on a market-by-market basis) is required for analog turn off.

³¹ Nielsen Media Research as shown on the web site of the Television Bureau of Advertising (www.tvb.org).

³² FCC *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming* (January 2001), CS Docket 00-132, p.4.

³³ Calculated as 102 million TV households less 84 million MVPD subscribing households.

³⁴ Statistical Research, Inc., data from *The Home Technology Monitor*, p.1. (Data is as of Fall 2000, analysis, April 2001.)

³⁵ The CEA defines a large screen as being 30 or more inches. Home theater sets (50 inches or more) demonstrate best the advantage of digital images; sets of 50 inches or more are five times more prevalent in cable households and seven times more in satellite households than in free-to-air households. See *Home Technology Monitor*, p.2.

³⁶ Free-to-air broadcast households have 2.1 sets on average per household; MVPD households average 2.7 sets per household on average. See *Home Technology Monitor*, p.1.